

HOLD AND TRACE PROCEDURE

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1.0 GENERAL

- 1.01 This Section describes the procedures to be followed by DDD Bureaus in conducting selective hold and trace activity on the DDD Network.
- 1.02 DDD Bureaus do holding and tracing of call failures on a *selective basis* to clear individual troubles of a repetitive nature, or to develop a pattern of failure.
- 1.03 A Bureau should first analyze all pertinent data to develop trouble patterns. When these do not find the trouble, the Bureau should utilize hold and trace procedures.
- 1.04 The indiscriminate use of hold and trace procedures in a manner other than that outlined in this section is to be avoided.
- 1.05 Holding and tracing is a practical maintenance tool when properly used, and should be encouraged to solve problems in a Bureau's "Prime Area."
- 1.06 Operator encountered call failures provide the largest source of potential held connections for tracing. Employee encountered failures and call-thru test set failures can also be held and traced.
- 1.07 No ring-no answer (NRNA) and no operator answer (NOA) are the major categories of failures suitable for tracing, and the most productive. Call failures which have the potential of causing a service interruption to the called subscriber are not held for tracing.

1.08 Primary consideration should be given to traces on traffic originating and terminating in a Bureau Prime Area or "backyard". However, tracing can also be done into the Bureau Prime Area Extension or distant NPAs when problems are evident and the *Bureau* in that area *concurs*.

1.09 When conducting a "hold and trace", the Bureau controls the progress of the trace by contacting forces along the route of the call until the failure is detected. Maintenance forces where the failure occurred are responsible for clearing the trouble and informing the Bureau of the trouble found.

1.10 The Bureau logs the details of the trace and the trouble found or not found, and merges it with its other data. Subsequent analysis of the TF and NTF details by the Bureau will provide information for further actions — i.e. more traces, issuance of a *pattern* requesting routine activity, a request for test calls, or training of the field forces.

1.11 An objective of a maximum of *30 minutes* has been established as a reasonable length of time for the completion of a trace. The time is measured from the time the connection is placed on hold until the Facility is returned to service. To meet this objective the Bureau should first determine that maintenance personnel are available to complete the traces.

1.12 As the number of TSPS positions increases, opportunities for holding and tracing operator call failures are reduced since TSPS are not provided with holding arrangements.

2.0 ANALYSIS BEFORE TRACING

2.01 Pattern analysis of trouble reports consistently produces a higher percent of trouble found than hold and trace. Therefore, productive DDD trouble shooting begins with effective pattern analysis.

2.02 *Selective hold and trace* is the discriminate use of tracing into areas with trouble patterns. *Random* tracing of operator reports to locate single isolated troubles violates the hold and trace concept.

2.03 Selective hold and trace is used to a location when that location has a large number of reports but they are so scattered that no pattern is evident.

2.04 When hold and trace is used to find trouble under such circumstances, results should be tabulated as "Hold and Trace" performance, *not* "Patterns Referral" performance.

2.05 Any *sudden* increase of reports on a trunk group or to an end office is a sufficient pattern to justify immediate hold and trace.

3.0 GROUND RULES FOR HOLDING AND TRACING

3.01 The following ground rules can be applied to "holding and tracing" as well as "call-thru testing".

(1) Restricted to "Prime Area" or Prime Area Extension and other NPAs if requested by the Bureau.

(2) Primarily used for the correction of no ring-no answer and no operator answer reports.

(3) Never to be done on a random basis without *prior detailed* analysis.

- (4) When tracing or call-thru testing, it must be determined that maintenance personnel are available to complete the trace.
- (5) Field may request traces or test calls into uncovered offices during covered periods to aid them in maintenance.
- (6) Traces are to be completed in 30 minutes or less and facilities released for revenue producing calls.

4.0 WHEN NOT TO TRACE OR PLACE TEST CALLS

4.01 Holding and tracing of call failures and call-thru testing are to be avoided

- (1) During busy hours.
- (2) On known over-loaded inter-toll and toll completing groups.
- (3) During major service interruptions.
- (4) During non-compatible working hours. (Time zone differences)
- (5) When traces cannot be completed in 30 minutes or less.

5.0 TRACING METHODS

5.01 Methods of tracing held connections will vary depending upon the types of switching equipment used, provision of the toll testboard lockout feature, availability of tone and hold or switchboard tone trunks, and operator direct or tandem access to outgoing trunks.

5.02 The tracing process consists basically of trunk identification along the path of the call to the point of call failure. At this point, the maintenance force is responsible to determine the cause and clear the trouble.

5.03 It is imperative that the exact failure and its cause be reported to the DDD Bureau to enable them to perform trouble found analysis. Repeating types of failures may indicate the lack of maintenance efforts, or inadequate or incorrect equipment arrangements and can be used to correct similar problems elsewhere.

5.04 When implementing hold and trace procedures, trunk identification must be simplified to reduce time and effort required. Manual tracing through major toll switching equipment is performed as a last resort in the event the lockout fails or is unavailable or tone cannot be detected.

6.0 EXAMPLES OF TYPICAL TRACES

6.01 The "Coordinated DDD Trouble Locating Plan" established procedures to be followed when tracing within a Bureau Prime Area or to a Prime Area Extension. Copies of those procedures are attached as follows:

Attachment #1 - Tracing thru a 4A Using Operator Lockout. (Prime Area)

Attachment #2 - Tracing thru a 4A Using Operator Lockout. (Prime Area Extension).

Attachment #3 - Tracing thru XBT Using "Tone and Probe".

Attachment #4 - Tracing from Class 4 to Class 3 - Trunk Selected in Multiple.

Attachment #5 - Tracing from Class 4 to Class 4 - Trunk Selected in Multiple.

Attachment #6 - Tracing from Class 4 to Class 3 to Class 4 - Trunk Selected in Multiple.

6.02 Any of the preceding can be applied when tracing through Class 1 or 2 offices.

7.0 TRACING BEYOND PRIME AND PRIME AREA EXTENSIONS

7.01 Hold and trace activities are most effective within a Bureau's Prime Area. However, it can be used with the same technique to go beyond these areas in cases of *extreme severity*.

7.02 The recommended procedure in these instances is to contact the distant Bureau (Verbal or "Network Service Improvement" form) concerning the trouble indications. They should analyze their own data or use special call-thru tests in their "backyard" to detect the trouble.

7.03 If the condition cannot be cleared in this manner hold and trace may be initiated with the *concurrence* of the distant Bureau. Tracing is not to be continued for the purpose of clearing *individual troubles*.

7.04 Contact between Prime Areas is conducted on a Bureau to Bureau basis. Contact with the maintenance personnel is not recommended. Experience has shown that misunderstanding due to differences in local procedures, and interfering with local trouble priorities will cause confusion in the field.

7.05 The need may occasionally arise for a Bureau to *request tracing* into its area from an adjacent high volume FNPA in order to resolve a problem. Cooperation should be extended to the requesting Bureau until the problem is resolved.

7.06 Tracing into Independent Company areas or their Service Bureaus "Prime Area" is conducted under the same conditions as mentioned in this Section. The Independent relations representative on the DDD Task Force will coordinate and make the appropriate arrangements.

8.0 FIELD RESPONSIBILITIES

8.01 Field forces have definite responsibilities and obligations in the area of Bureau conducted hold and trace activity. The field will fulfill its responsibilities more readily if it understands the benefits to improved maintenance and service.

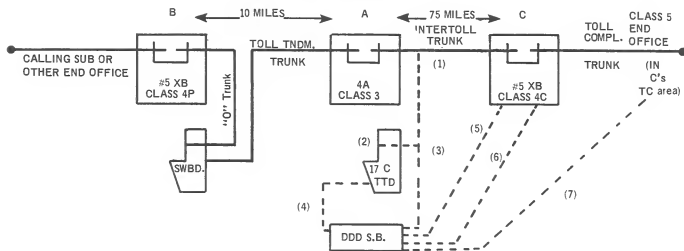
8.02 Field supervisors must have a working knowledge of the general plan for hold and trace in the prime area. They should realize the value of this program for providing specific information to direct maintenance effort toward patterned trouble spots. They should see the role of the Bureau in directing the program and recommending maintenance effort, but they must also realize that the basic responsibility for corrective action remains in the field.

8.03 Trouble tickets prepared in the field on traces shall be incorporated into the regular CMP ticket file. These tickets shall be analyzed in conjunction with other data to determine the need for maintenance effort.

8.04 The field forces should notify the Bureau as soon as the trouble is located so that the Toll facilities may be released. The equipment in trouble should be removed from service until it is fixed.



TROUBLE TRACING THRU 4A USING OPERATOR LOCKOUT - TO END OFFICE PRIME AREA



B and C are in A's prime area.

B's operator encounters a trouble to be held and reported.

Operator dials reporting code and tandem trunk number as instructed:

1. Locks forward the intertoll trunk seized on call which met trouble.
2. Intertoll trunk is identified by lockout lamp in 17C TTD.
3. Operator gives trouble details to DDD S.B. clerk. Clerk prepares IBM card.
4. DDD S.B. decides - should this call be held and traced? Guided by posted instructions.

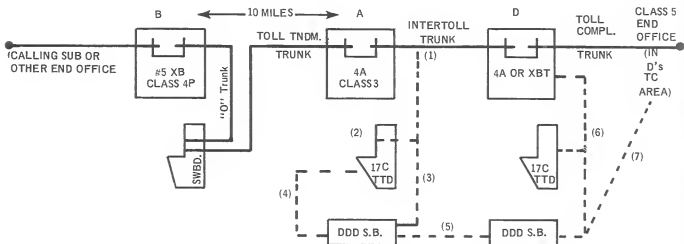
No - S.B. tells operator to remove cord. 17C tallies trunk failure, releases connection, tests trunk and records results (see B.S.P. 660-625-014) S.B. codes IBM card - "No Action," and tallies failure against tandem trunk and toll trunk group involved.

Yes - S.B. tells operator to leave cord in. 17C is unable to release connection. S.B. calls 17C and asks for identity of trunk involved. If no toll trunk is locked out, S.B. calls 4A maintenance center for trace on tandem trunk.

5. DDD S.B. gives necessary details to C's switchman and requests trace.
6. Switchman traces thru #5 machine. Switchman finds trouble, identifies toll completing trunk or refers back to DDD S.B. if call has not reached #5 machine.
7. DDD S.B. arranges trace thru end office. DDD S.B. gets final report and arranges release of trunk and records results on IBM card.



TROUBLE TRACING THRU 4A USING OPERATOR LOCKOUT - TO END OFFICE (PRIME AREA EXTENSION)



Assume D is in A's prime area extension.

B's operator encounters a trouble to be held and reported.

Operator dials reporting code and tandem trunk number, as instructed:

1. Locks forward the intertoll trunk seized on call which met trouble.
2. Intertoll trunk is identified by lockout lamp in 17C TTD.
3. Operator gives trouble details to DDD S.B. clerk. Clerk prepares IBM card.
4. DDD S.B. decides - should this call be held and traced? Guided by requests and advice from D's DDD S.B.

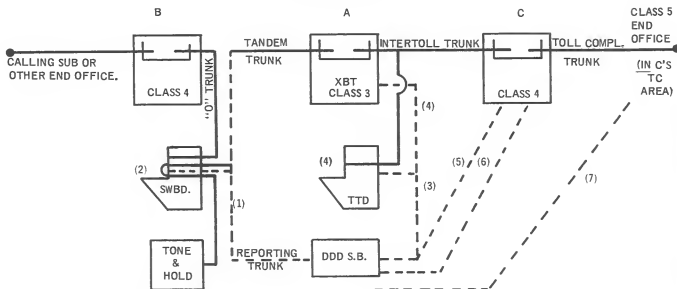
No - S.B. tells operator to remove cord. 17C tallies trunk failure, releases connection, tests trunk and records results (see B.S.P. 660-625-014) S.B. codes IBM card - "No Action," and tallies failure against tandem trunk and toll trunk group involved.

Yes - S.B. tells operator to leave cord in. 17C is unable to release connection. S.B. calls 17C and asks for identity of toll trunk. If no toll trunk is locked out, S.B. calls 4A maintenance center for trace of tandem trunk.

5. A's DDD S.B. gives necessary details to D's DD S.B. A's S.B. codes IBM card - "Ref'd to D." D prepares IBM card.
6. If desired, D arranges trace thru 4A or XBT. Calls D's 17C TTD if call has not reached switching equipment. Switchman finds trouble or identifies toll completing trunk.
7. DDD S.B. arranges trace thru end office, if necessary. Gets final report and records result. Notifies A's S.B. to have trunk released.



TROUBLE TRACING THRU XBT USING "TONE AND HOLD" - TO END OFFICE (PRIME AREA)



C is in A's prime area.

B's operator encounters a call to be held and reported.

1. Operator gives details to DDD S.B. S.B. prepares IBM card and decides release or hold trace. Guided by posted instructions.

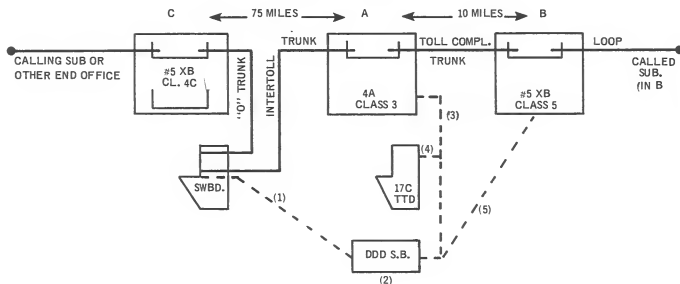
If release - have operator remove cord, code IBM card - "No Action," tally failure against tandem trunk and first choice intertoll trunk group to called place.

If hold and trace:

2. S.B. instructs operator to put answer cord in designated tone and hold jack.
3. DDD S.B. asks TTD to identify intertoll trunk by naming called place and tone and hold trunk used.
4. If intertoll trunk can not be found, DDD S.B. calls XBT maintenance center for check of tandem trunk and XBT.
5. DDD S.B. calls C switchman necessary details, intertoll trunk number and asks for trace.
6. Switchman finds trouble or identifies toll completing trunk, and gives information to A's DDD S.B.
7. A's DDD S.B. calls end office for trace. DDD S.B. gets final report and closes report and has trunk released.



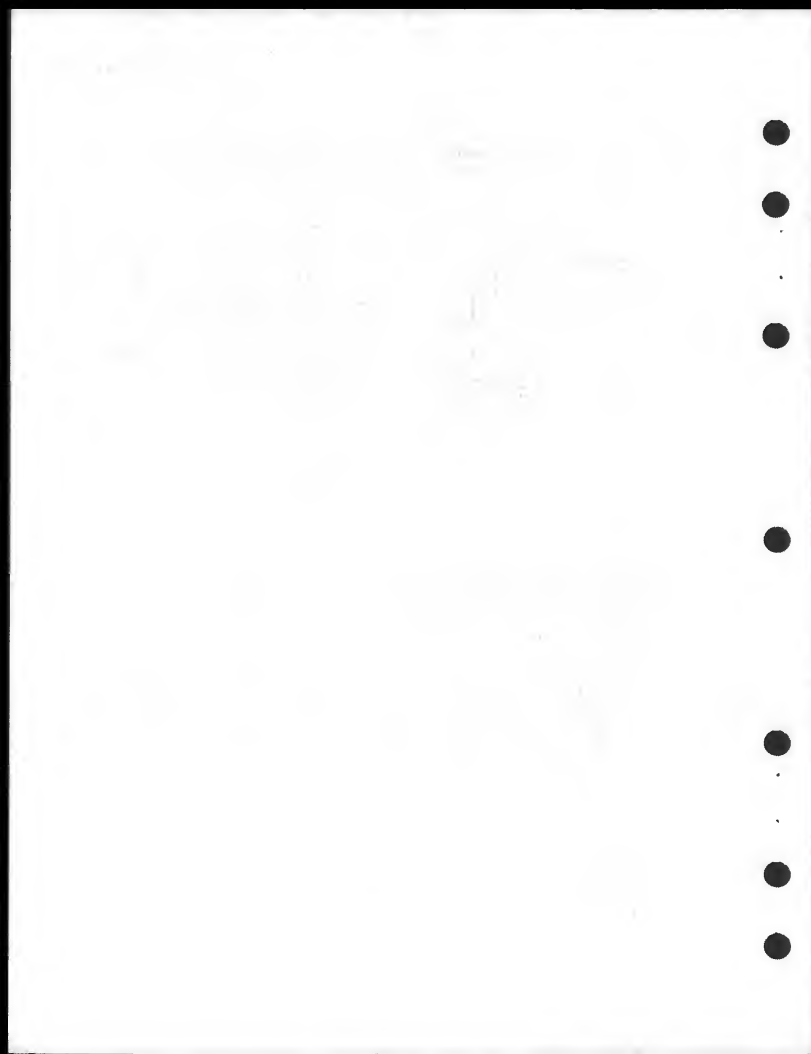
TROUBLE TRACING CLASS 4 TO CLASS 3 – TO END OFFICE
OPERATOR SELECTS INTERTOLL TRUNK IN MULTIPLE
(PRIME AREA)

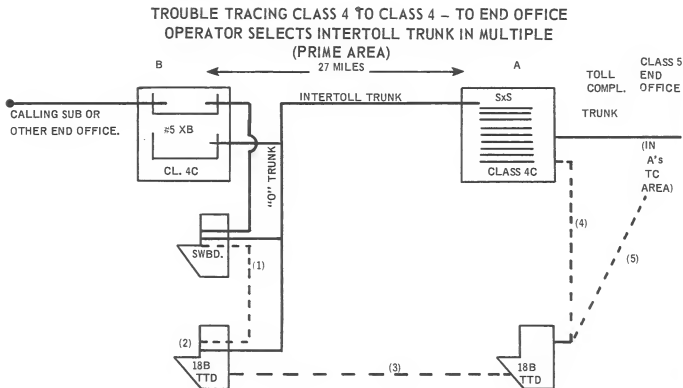


C and B are in A's prime area.

C's operator encounters a trouble to be held and reported.

1. Operator seizes another trunk in A's 4A group, dials report code as instructed, and reaches A's DDD S.B. Operator gives trouble details, including C – A trunk no., to S.B. S.B. prepares IBM card.
2. DDD S.B. decides – should this call be held and traced? Guided by posted instructions.
No – S.B. tells operator to remove cord, tallies failure against C – A trunk.
Yes – S.B. tells operator to leave cord in.
3. S.B. arranges trace thru 4A. Switchman finds trouble or identifies toll completing trunk to B.
4. S.B. calls in 17C if call has not reached 4A.
5. If necessary, S.B. arranges trace thru end office. Gets final report, closes IBM report card and has cord taken down at C.





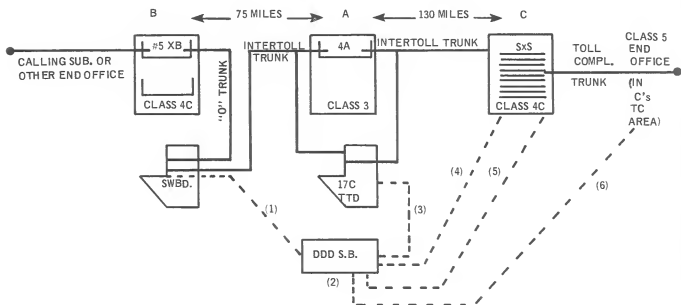
A is in B's prime area.

Operator encounters a trouble to be held and reported.

1. Operator reports intertoll trunk number and details of trouble to a report receiving desk. (B is not large enough to justify a DDD S.B.)
2. TTD prepares E-4008 form. Decides - release or hold and trace.
If release - tally failure against trunk, release connection, test and record result.
If hold and trace - hold trunk. Verify call is OK out of B.
3. B's TTD calls A's TTD, gives details, offers for trace. A prepares E-4008 form.
B codes E-4008 form - "Ref'd to A."
4. If desired, A TTD arranges for trace thru switching equipment. Switchman finds trouble or identifies toll completing trunk.
5. A's TTD arranges trace thru end office. Gets final report and records. Calls B's TTD to release trunk.



**TROUBLE TRACING CLASS 4 TO CLASS 3 TO CLASS 4 - TO END OFFICE
OPERATOR SELECTS INTERTOLL TRUNK IN MULTIPLE
(PRIME AREA)**



C is in B's prime area.

B's operator encounters a trouble to be held and reported.

1. Operator seizes another trunk in A's 4A group, dials report code as instructed, and reaches A's DDD S.B. Operator gives trouble details, including B - A trunk number, to S.B. S.B. prepares IBM card.
2. S.B. decides - should this call be held and traced. Guided by posted instructions
No - S.B. tells operator to remove cord, tallies failure against B - A trunk and against trunk group to C.
Yes - S.B. tells operator to leave cord in.
3. S.B. calls 17C, gives B - A trunk number and asks for identification of trunk selected to C. 17C investigates if call has not reached A.
4. S.B. gives necessary details to C and requests trace.
5. C's switchman traces thru SxS equipment. If necessary reports T.C. trunk to A's DDD-S.B. S.B. closes IBM report card and has cord taken down in B.
6. If trace is required to End Office - A's DDD - S.B. contacts switchman in End Office for trace. When information of trace or trouble details are received A's DDD -SB closes IBM report and has cord taken down.

